NAD SERVICE MANUAL

7250PE

AM/FM RECEIVER

NAD 7250PE SERVICE MANUAL

NOTE: This manual covers all versions.
A: U.S.A.
A1: Canada
B: U.K.
B1: Australia
C: EUROPE and others
C1: W-Germany

REAR PANEL

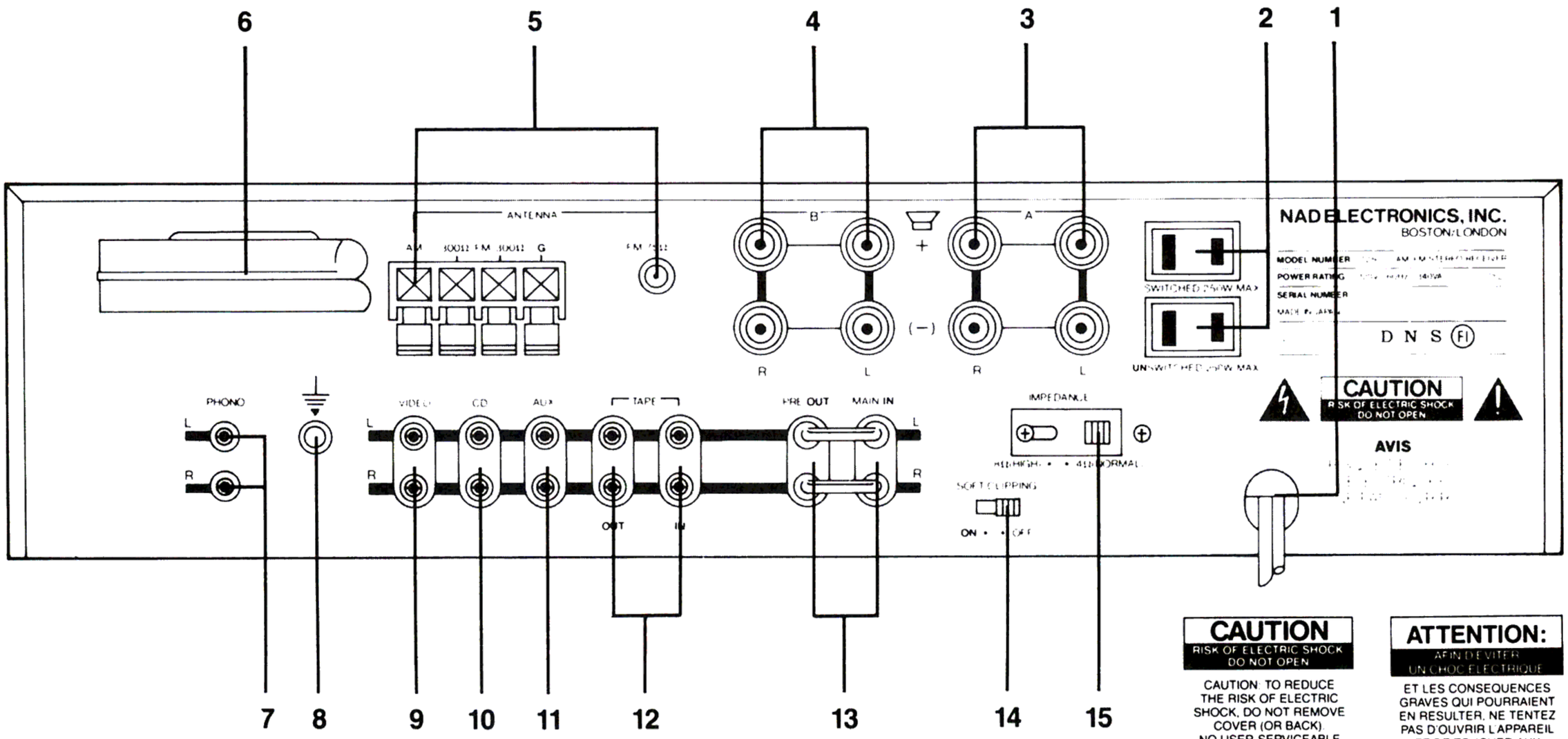
1. AC Line Cord.
2. AC Outlets (not in U.K. version).
3. Speakers A.
4. Speakers B.
5. Antenna Terminals.
6. Am Rod Antenna.
7. Phono Input.
8. Phono Ground.
9. Video.
10. CD Input.
11. Aux Input.
12. Tape Input/Output.
13. Preamp Out, Main In.
14. Soft Clipping.
15. Speaker Impedance.

LE PANNEAU ARRIERE

1. Cordon d'alimentation.
2. Prises CA.
3. Enceintes A.
4. Enceintes B.
5. Bornes d'antennes.
6. Antenne AM.
7. Entrée phono.
8. Masse phonolecteur.
9. Video.
10. Entrée lecteur de disque compact.
11. Entrée Auxiliaire
12. Entrée/Sortie magnétophone.
13. Sortie de préamplification.
14. Ecrêtage en douceur.
15. Impédance.

RÜCKSEITE

1. Netzkabel.
2. Sekundär-Steckdosen.
3. Anschlüsse für Lautsprechergruppe A.
4. Anschlüsse für Lautsprechergruppe B.
5. Antennen-Anschlüsse.
6. Mittelwellen (AM)-Ferritantenne.
7. Plattenspieler-Eingang.
8. Masseanschluß für Plattenspieler.
9. Video.
10. CD-Eingang.
11. Reserve Eingang
12. Tonbandgerät Eingang/Ausgang.
13. Vorverstärker-Ausgang/Endverstärker-Eingang.
14. Impulsbegrenzungs-Schalter.
15. Lautsprecherimpedanz-Schalter.



CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN

CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL

ATTENTION:
AFIN D'EVITER UN CHOC ELECTRIQUE

ET LES CONSEQUENCES GRAVES QUI POURRAIENT EN RESULTER, NE TENTEZ PAS D'OUVRIR L'APPAREIL ET DE TOUCHER AUX COMPOSANTS INTERNES SANS LA PRESENCE D'UNE PERSONNE QUALIFIEE

FRONT PANEL

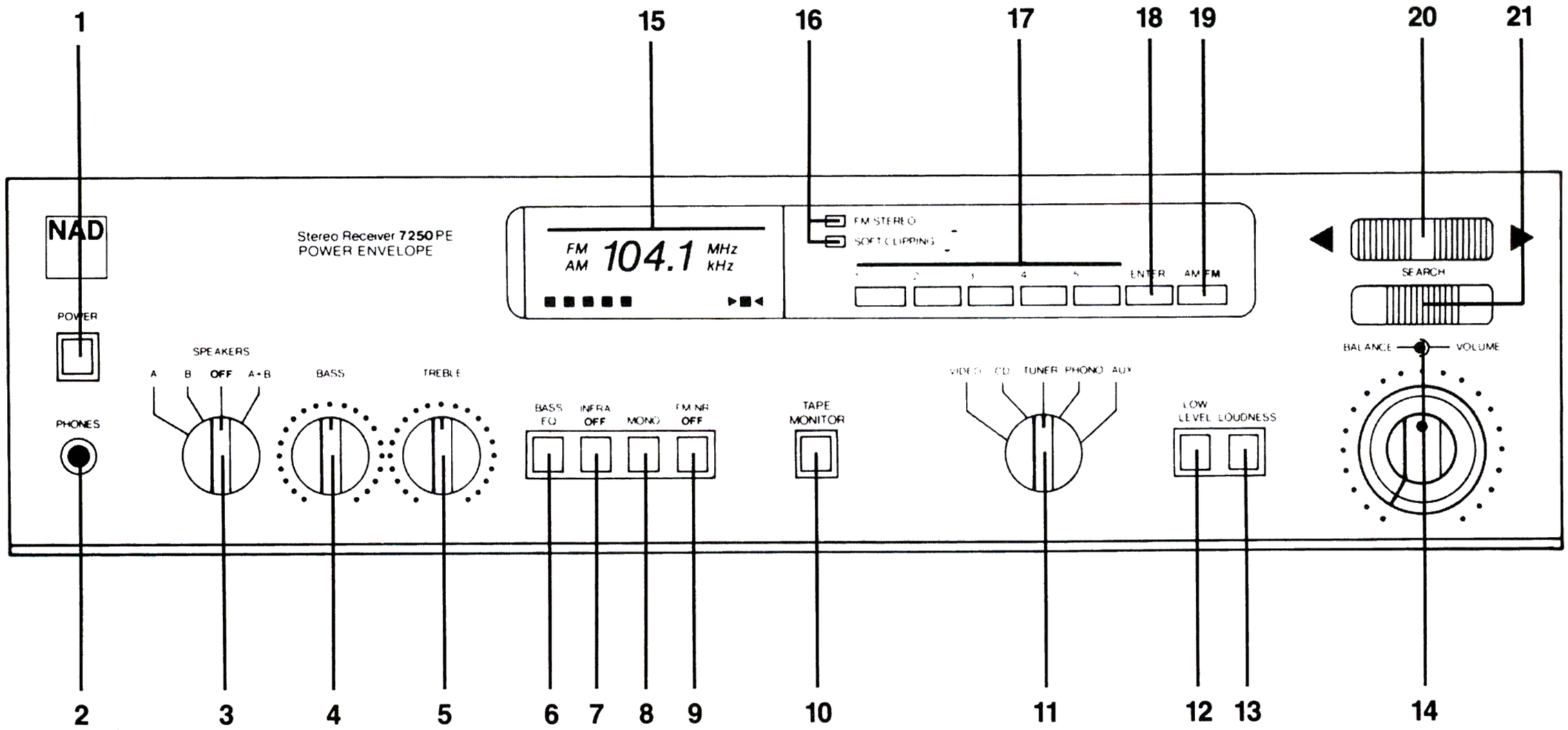
1. Power.
2. Phones.
3. Speaker Selector.
4. Bass.
5. Treble.
6. Bass EQ.
7. Infrasonic Filter Off.
8. Mono.
9. FM NR Off.
10. Tape Monitor.
11. Input Selector.
12. Low Level.
13. Loudness Compensation.
14. Volume/Balance.
15. Tuning Display.
16. Status Indicators.
17. Station Pre-sets.
18. Memory Enter.
19. AM/FM.
20. Up/Down Tuning.
21. Search.

LE PANNEAU AVANT

1. Alimentation.
2. Casque d'écoute.
3. Sélecteur d'enceintes.
4. Graves.
5. Aigus.
6. Bass Eq.
7. Filtre infrasonique.
8. Mono.
9. FM NR Off.
10. Commutateur de surveillance de bande.
11. Sélecteur d'entrée.
12. «Low Level».
13. Commutateur de contour sonore.
14. Volume Equilibrage.
15. Affichage de la fréquence d'accord.
16. Témoins.
17. Touches de présélection.
18. Mémoire.
19. AM FM.
20. Syntonisation électronique.
21. Touche de syntonisation.

FRONTSEITE

1. Netzschalter.
2. Kopfhörer-Anschluß.
3. Lautsprecher-Wahlschalter.
4. Baßsteller.
5. Höhensteller.
6. Baß Equalizer-Schalter.
7. Schalter für Infraschall-Filter.
8. Mono/Stereo-Schalter.
9. Stereo-Rauschminderung.
10. Vor Uber Band-Schalter.
11. Eingangs-Wahlschalter.
12. Schalter fur Lautstärkeabsenkung.
13. Gehörrichtige Lautstärke-Einstellung.
14. Lautstärke/Balance-Steller.
15. Abstimmanzeige.
16. Anzeigen fur Betriebszustände.
17. Stationstasten.
18. Eingabebereitschaft für Stationstastenspeicher.
19. Wellenbereichsschalter für UKW/Mittelwelle.
20. Wippe zur Frequenzeinstellung.
21. Suchlauf.



SPECIFICATIONS

NOTE: Measurements referenced to 8 ohms are taken with the Speaker Impedance Selector set to "8 ohm (High)". Measurements for 4 and 2 ohms are taken with the impedance selector at "4 ohm (Normal)". Specifications are measured in accordance with EIA Standard RS-490 (IHF A-202) for amplifiers and ANSI-IEEE Standard 185 (1975) (IHF T-200) for tuners. Tuner sensitivity is measured via 75 ohm coaxial input and converted to equivalent 300 ohm values.

POWER AMPLIFIER SECTION

CONTINUOUS AVERAGE POWER OUTPUT INTO 8 OHMS (min. RMS power per channel into 8 ohms, 20 Hz – 20 kHz, both channels driven, with no more than the rated distortion)		50 W (17 dBW)
Rated distortion (THD), 20 Hz – 20 kHz		0.03 %
Clipping power (max. continuous power per channel)	8 ohms	55 W
IHF dynamic headroom at 8 ohms		+6 dB
IHF dynamic power (max. short-term power per channel)	8 ohms 4 ohms 2 ohms	200 W 250 W 300 W
Peak output current (amperes)		> 30 A
Slew factor		> 50
Slew rate		30 V/μsec
Damping factor (ref. 8 Ω, at 50 Hz)		> 50
Input impedance		30 kΩ
Input sensitivity for 1 W/rated power		140 mV/1 V
Power amplifier gain		26 dB (20X)
THD (Total Harmonic Distortion, 20 Hz – 20 kHz, from 250 mW to rated output)		< 0.03 %
SMPTE I.M. (Intermodulation Distortion, 60 Hz + 7 kHz, 4:1, from 250 mW to rated output)		< 0.03 %
IHF I.M. (CCIF IM Distortion, 19 + 20 kHz at rated output)		< 0.03 %

PREAMPLIFIER SECTION

PHONO INPUT

Input impedance	R = 47 kΩ; C = 100 pF
Input sensitivity (ref. 1 watt)	0.4 mV
Input overload at 20 Hz/1 kHz/20 kHz	18 mV/170 mV/1.5 V
THD (20 Hz – 20 kHz) and IM Dist. at +30 dB level	< 0.04 %
RIAA response accuracy	±0.5 dB
S/N ratio, IHF A-weighted, with cartridge connected	76 dB re 5 mV

LINE LEVEL INPUT (AUX, TAPE)

Input impedance	R = 10 kΩ; C = 220 pF
Input sensitivity	25 mV for 1 W out 150 mV for 50 W out
Maximum input signal	> 10 V
Signal to noise ratio, A-weighted	85 dB re 1W > 100 dB ref. rated power
Frequency response, 20 Hz – 20 kHz	±0.5 dB

OUTPUTS

Preamp out impedance	800 ohms
Maximum output level	10 V
Tape output impedance	1,000 ohms (buffered)
Tape output infrasonic filter	–3 dB at 15 Hz, 12 dB/octave

CONTROLS

Treble	±7 dB at 10 kHz
Bass	±7 dB at 100 Hz
Speaker Equalization	+3 dB at 70 Hz, +6 dB at 32 Hz
Infrasonic filter (switchable)	–3 dB at 15 Hz, 12 dB/octave
Audio muting (low level)	–20 dB

FM TUNER SECTION

Input sensitivity	Mono, –30 dB THD + N		10.3 dBf (1.8 μV/300Ω, or 0.9 μV into 75Ω)
	Mono, 50 dB S/N		14.2 dBf (2.8 μV)
	Stereo, 50 dB S/N		29 dBf (15 μV), FM NR on 36 dBf (35 μV), FM NR off
	Stereo 60 dB S/N		40 dBf (55 μV), FM NR on 46 dBf (110 μV), FM NR off
Capture ratio (at 45 and 65 dBf)			< 1.5 dB
AM rejection (at 65 and 85 dBf)			> 65 dB
Selectivity	Alternate channel		70 dB
	Adjacent channel		8 dB
Image rejection			75 dB
R.F. intermodulation			65 dB
I.F. rejection			75 dB
SCA rejection			70 dB
Subcarrier suppression (19 & 38 kHz)			60 dB
THD at 100 % modulation		1 kHz	100 Hz – 6 kHz
	Mono	0.08 %	0.2 %
	Stereo	0.08 %	0.3 %
Signal-to-noise ratio A-weighted, 65 dBf	Mono	82 dB	
	Stereo	76 dB (typ. 80 dB at 75 dBf)	
Frequency response, 30 – 15 kHz			±0.5 dB
Stereo separation (FM NR off)		1 kHz	50 dB
		30 Hz – 10 kHz	40 dB

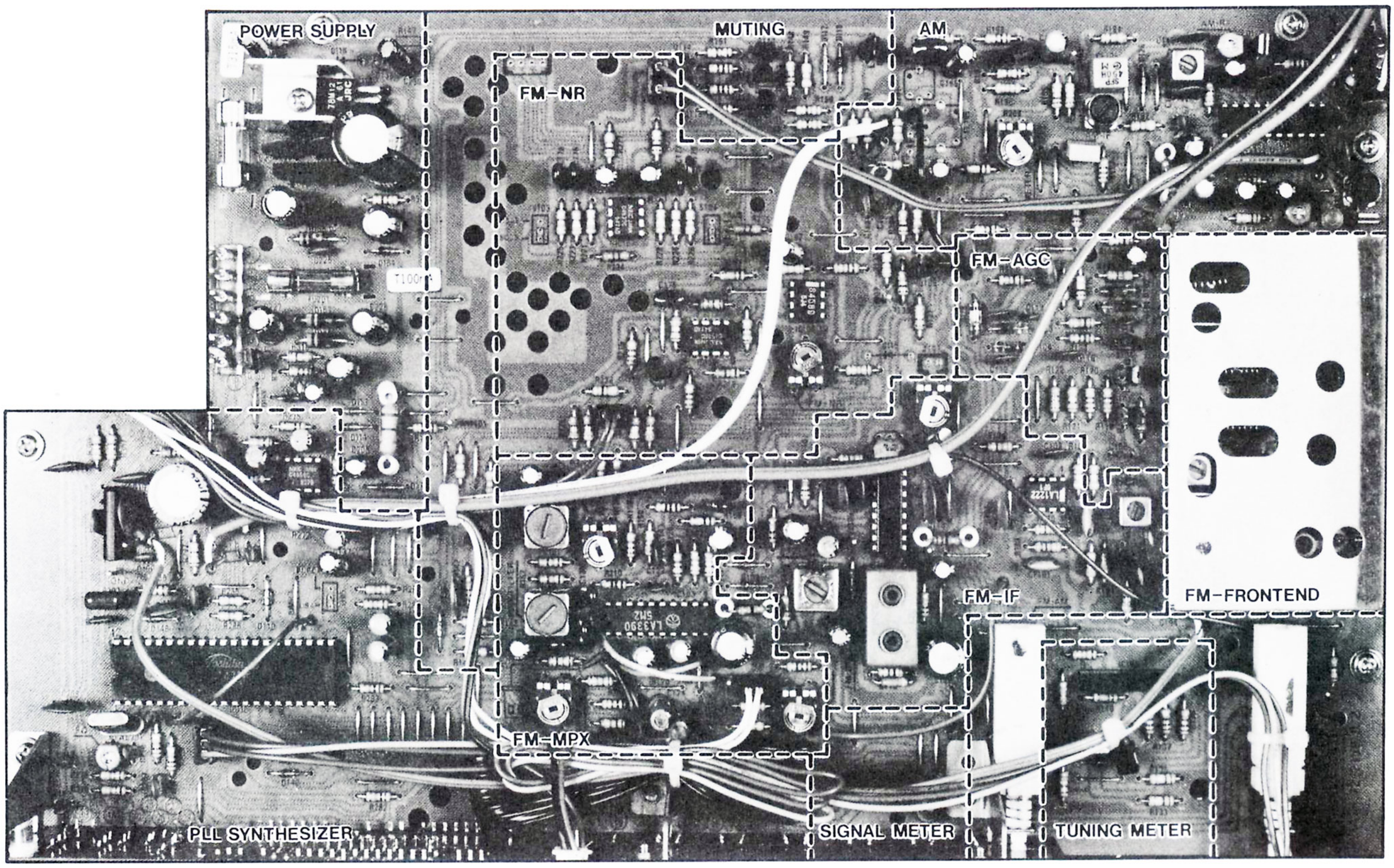
AM TUNER SECTION

Usable sensitivity	300 μV/meter
THD	0.5 %
Selectivity	35 dB
Image rejection	50 dB
I.F. rejection	50 dB
S/N ratio (30 % mod., 50 mV input)	45 dB

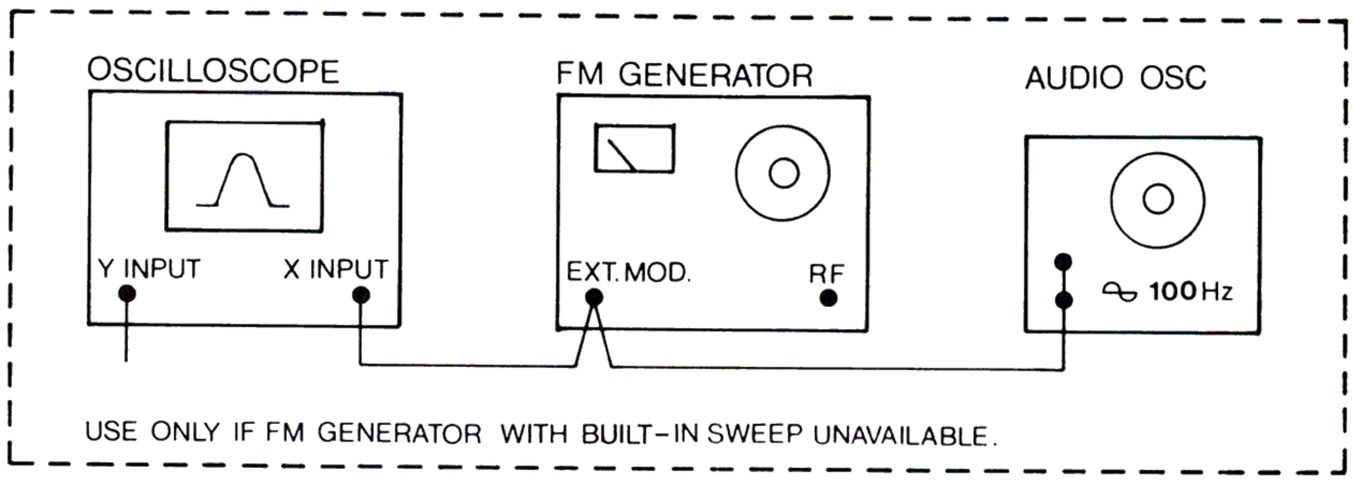
PHYSICAL SPECIFICATIONS

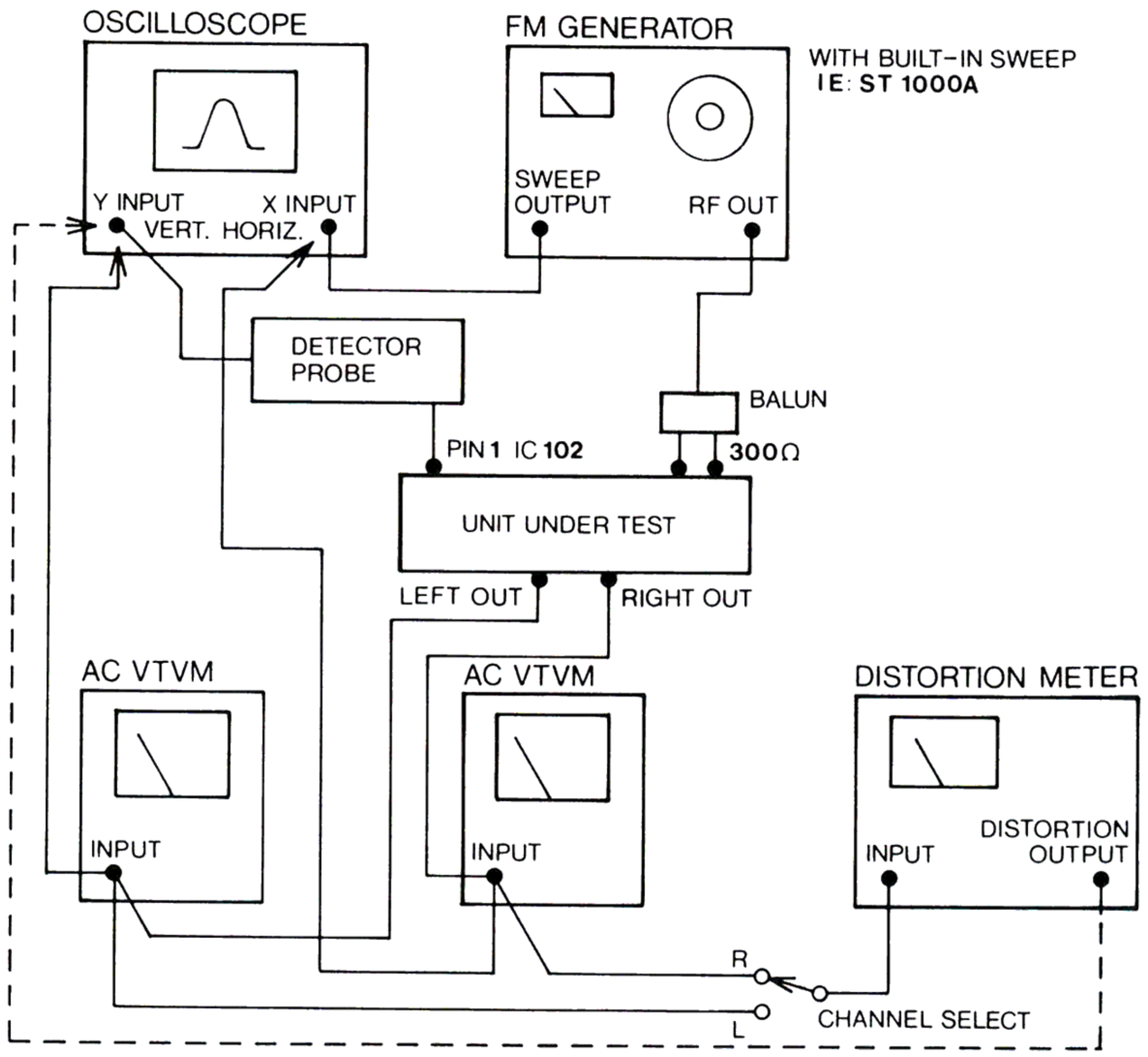
Dimensions (width x height x depth)	42 x 10.8 x 38 cm. 16.5 x 4.25 x 15 in.
Net weight	9.2 kg./20 lb. 6 oz.
Shipping weight	10.6 kg./23 lb. 6 oz.
Power consumption (50/60 Hz at 110, 120, 220 or 240 VAC)	290 W

INTERNAL VIEW

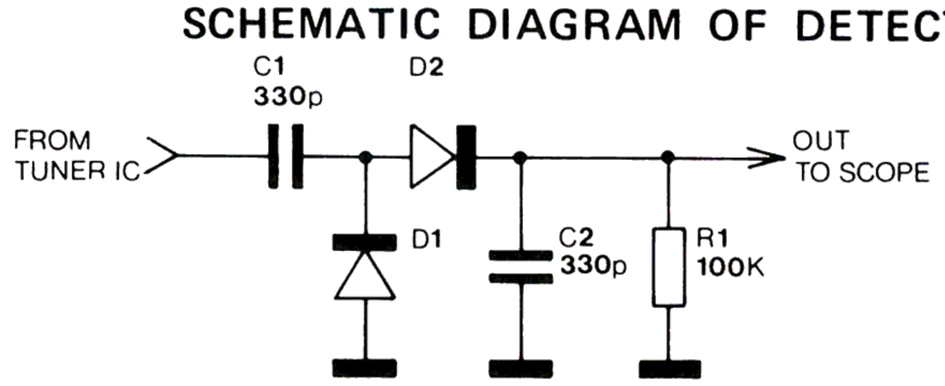


SUGGESTED INSTRUMENTATION HOOKUP



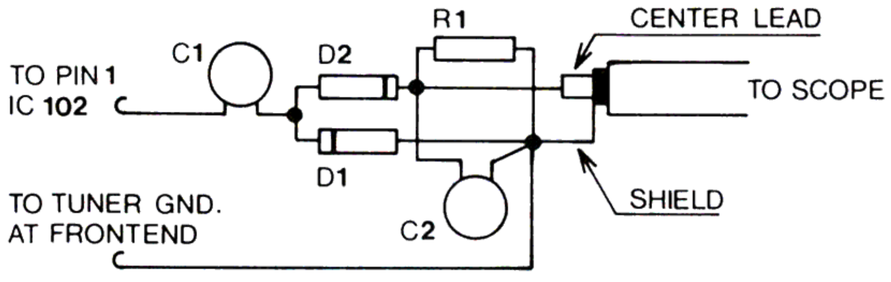


SCHEMATIC DIAGRAM OF DETECTOR PROBE



Diodes should be point-contact germanium; Some commonly available types are: OA80
OA81
AA119
1N60
1N34
1N22

PICTORIAL DIAGRAM OF DETECTOR PROBE



Keep leads as shortas possible, to minimize stray signal pickup.

FM ALIGNMENTS

NECESSARY INSTRUMENTATION

FM GENERATOR (less than 0.05% THD)
STEREO GENERATOR (less than 0.05% THD, more than 50 dB sep.)
AUDIO GENERATOR (not necessary if FM generator has built in sweep; i.e., SOUND TECHNOLOGY ST 1000A and ST 1020A)
AC VTVM's (or one with a left/right switch)
THD ANALYZER (resolution less than 0.1%)
OSCILLOSCOPE (5mV or better sensitivity, X input capability)
FREQUENCY COUNTER
VOM or DMM (high impedance, must read in mV)
DETECTOR PROBE

IMPORTANT — While all FM generator output levels hereafter are referred to the 300 ohm input, 75 ohm input can be used, but be aware of possible equipment groundloops and divide the RF output levels by 2.
Before alignments commence set input selector to tuner and release mono and FM NR OFF switches (out).

FRONTEND — Alignment of frontend should only be necessary after repair to frontend or crystal oscillator circuits (pin 2 and 3 on IC 110).

A TUNING VOLTAGE (OSCILLATOR)

It is essential to check tuning voltage before aligning the rest of the frontend.

1 Connect DMM between ground and TP 102.

2 Tune to 108 MHz and adjust C 20 if voltage is incorrect.

SPECIFICATION 22V ± 0.5V

3 Tune to 88 MHz and read voltage. Adjust L 6 if voltage is incorrect.

SPECIFICATION 3.2V ± 0.5V

4 Repeat step 2 and 3 until readings are within tolerances.

B RF ADJUSTMENT (TRACKING)

1 Connect RF generator to 300 ohm antenna input and detectorprobe to pin 1 IC 102 with ground to tunershield. Adjust sensitivity of oscilloscope to maximum (5mV or better) and modulate FM generator sweep ± 300 kHz or more.

2 Set tuner to 105 MHz, enter into preset 5, and tune generator so that curve appears on oscilloscope. Turn down RF input level so that curve covers approximately 1/2 of oscilloscope display.

3 Adjust C 2, C 10 and C 12 to maximum curve height while reducing input to keep entire curve on display.

4 Set tuner to 90 MHz, enter into preset 1, and tune generator so that curve appears on oscilloscope display.

5 Adjust L 2, L 4 and L 5 to maximum curve height. The coils adjust by gently extending or contracting the aircoil with a non-metalic or non-static tool (i.e., plastic knit-pin or a wooden stick). Be careful not to deform the coils.

6 Repeat steps 2, 3, 4 and 5 (use preset 1 and 5) until both frequencies are at maximum curve height.

NOTE: 105 MHz curveheight is typically slightly stronger than 90 MHz.

C IF ADJUSTMENT

1 Set tuner to approximately 98 MHz (the tuner must be tuned to an unoccupied frequency) enter into preset 3, and tune FM generator to display a curve on oscilloscope.

2 Adjust L 8 and L 101 to maximum and symmetrical curve on the display, using as little input as possible.

NOTE: Maximum input 500 μV, typical curveheight 4 mV at 150 μV and 15 mV at 300 μV.

D DETECTOR COARSE ADJUSTMENT (OPTIONAL, NEEDED ONLY IF DETECTOR WAS REPAIRED)

1 Reduce sweep modulation level to ± 75 kHz and set input level to 300 μV.

2 Adjust FM generator frequency so that both legs of the inverted U-shaped curve are equally high on the display. The curve should be almost perfectly symmetrical.

3 Disconnect detectorprobe from tuner and oscilloscope. Connect either of the tape rec. outputs to the oscilloscope.

4 The oscilloscope should now display a diagonal line. Adjust L 102 primary (closest to IC 102) to maximum curveheight and L 102 secondary to minimum curve height and straightest possible line. Go back and forth between primary and secondary till both are peaked.

NOTE: Both the cores should be within 1.5mm from the top of the form.

E DETECTOR ALIGNMENT (FINAL)

1 Disconnect detectorprobe and connect tape rec. output to VTVM's, oscilloscope and distortion analyzer.

2 Switch stereo generator to 1 kHz 100% (± 75 kHz) mono modulation and oscilloscope to normal internal sweep 0.2 mS and 0.5 V/cm sensitivity.

3 Detector reference frequency.

Reduce FM generator output level while monitoring THD from left channel. When THD increases to 3%, fine tune the FM generator frequency to minimum THD. Reduce FM generator output level and fine tune till no reduction in the 3% THD can be achieved by fine tuning. Use this frequency for all the following detector, MPX and FM NR adjustments.

NOTE: The typical input level for this 3% THD should be 1.6 μV to 2.3 μV. This is done only to "line up" the frequency from the generator to the tuner's frequency.

If IHF usable sensitivity (–30 dB THD + N = 3.16%) is to be verified, a proper IHF bandpass-filter must be used.

4 Connect DMM across TP 104 (negative) and TP 105 (positive). Set FM generator output to 1000 μV

5 Adjust L 102 primary (closest to IC 102) for 0 V on DMM.

TOLERANCE ± 50 mV

6 Adjust L 102 secondary for lowest THD.

SPECIFICATION less than 0.1%

7 Repeat steps 3, 5 and 6 till no further improvements. Record the DMM's final reading for use later in the adjustments. (I – 3)

F AUTOSEARCH LEVEL.

1 Connect DMM between ground and TP 107.

2 Increase FM generator output upwards from 0 and adjust R 107 "MUTE" so that DMM reading goes from 0 V to approximately 4.8 V at 10 μV input.

TOLERANCE ± 2 μV

G STEREO DECODER, MPX FILTERS.

1 VCO

Connect a frequency counter and a 200 k ohm resistor in parallel between ground and TP 108.

2 Set FM generator to 1000 μV output and no modulation.

3 Adjust R 164 "MPX VCO" for a 19000 Hz reading on the counter.

TOLERANCE ± 100 Hz

4 Disconnect frequency counter and resistor and depress FM NR defeat switch (in).

5 Stereo switch threshold.

Modulate FM generator 1 kHz 100% left only plus 19 kHz pilot 8 - 10%.

6 Increase FM generator level upwards from 0 and adjust R 167 "ST SW" so that stereo light turns on and audio outputs, as watched on VTVM's and oscilloscope, switches to one channel only at 10 μV input level.

TOLERANCE + 5 μV

NOTE: When turning input level down the unit will switch into mono at a lower level, typically 7 μV.

7 Stereo separation.

Set FM generator output to 1000 μV, modulate left channel only.

8 Adjust R 158 for minimum on right channel VTVM.

9 Modulate FM generator right channel only and adjust R 158 for minimum on left channel VTVM.

10 If the minimum in step 8 and 9 are different, adjust R 158 so that the readings are the same in both channels.

SPECIFICATION better than 50 dB separation

11 MPX filter

Turn off audiomodulation, leaving pilot tone only. Disable IHF filter, or external 19 kHz filter.

12 Check 19/38 kHz suppression.

SPECIFICATION more than 60 dB

13 If unit does not meet specification adjust FL 102 "MPX FILTER" on left channel and FL 103 "MPX FILTER" on right channel to minimum output.

NOTE: DO NOT ADJUST THE MPX FILTERS UNLESS NECESSARY, the cores are brittle and break easily.

14 Release the FM NR DEFEAT switch (out).

H FM NR CIRCUIT

Confirm that FM NR switch is set to OFF position at first.

1 Feed from SG to the antenna input 125 μV (300 ohms), 98.00 MHz with 100% stereo modulation, and set reference for S/N measurement.

With reference set, cancell the stereo modulation of 98.00 MHz and confirm that S/N ratio at this stage reads —60 dB approx.

2 Switch FM NR on, and adjust R-230 so that S/N is improved by 2 dB.

3 Switch FM NR off, and feed 40 μV of 98.00 MHz with 100% stereo modulation to set reference for S/N.

Cancell stereo modulation and confirm that S/N at this stage reads —50 dB.

4 Switch FM NR on, and confirm that S/N ratio is improved by 5 - 13 dB.

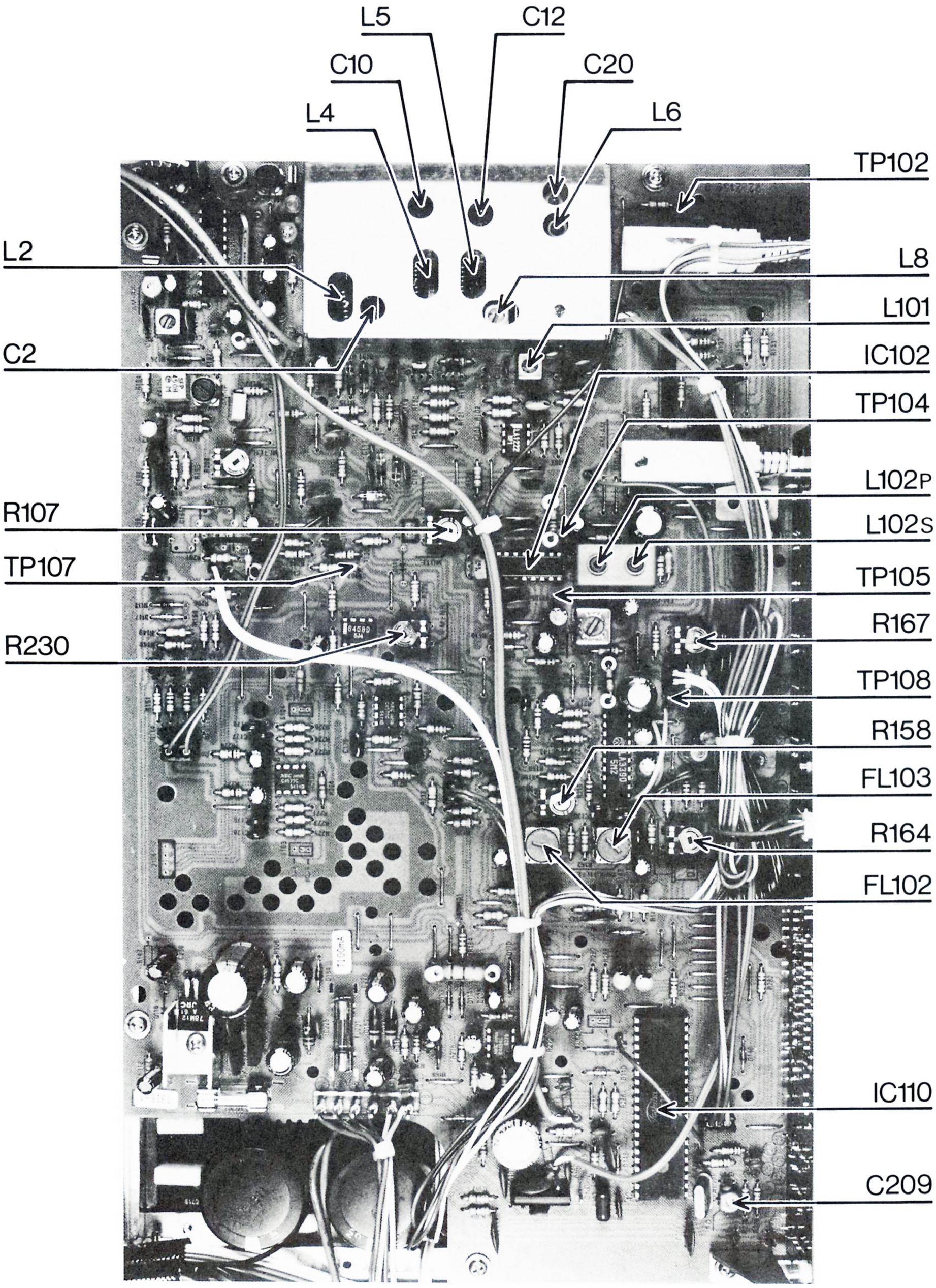
I SYNTHESIZER FREQUENCY

1 Tune to a known accurate frequency source, i.e., broadcasting station or synthesized/digital display FM generator preferably in the midband 95 - 100 MHz.

2 Connect DMM across TP 104 (negative) and TP 105 (positive).

3 Adjust C 209 "FQ" so that DMM reads the same as recorded in E — 7.

TOLERANCE ± 10 mV



AM ALIGNMENTS

A OSCILLATOR.

1 Connect DMM to TP 101 and gnd.

2 Tune to 1710 kHz. Enter into preset 1. Adjust C 148 for reading of 31 ± 0.5VDC.

3 Tune to 520 kHz. Enter into preset 2. Adjust L 103 for reading of 1.8 ± 0.1 VDC.

4 Repeat steps 2 and 3 until within tolerances.

B ANTENNA, IF

1 Swing antenna away from chassis and peel back label (if present) to expose adjustment tab.

2 Connect DC voltmeter to centertap, R 208 and gnd.

3 Tune to station of moderate strength, near 600 kHz. Enter into preset 3. Adjust L 951 (move tab under label on antenna) for maximum reading on meter. (Use non-ineractive tool, such as plastic or wooden stick.)

4 Adjust L 104 and L 106 for maximum reading on meter.

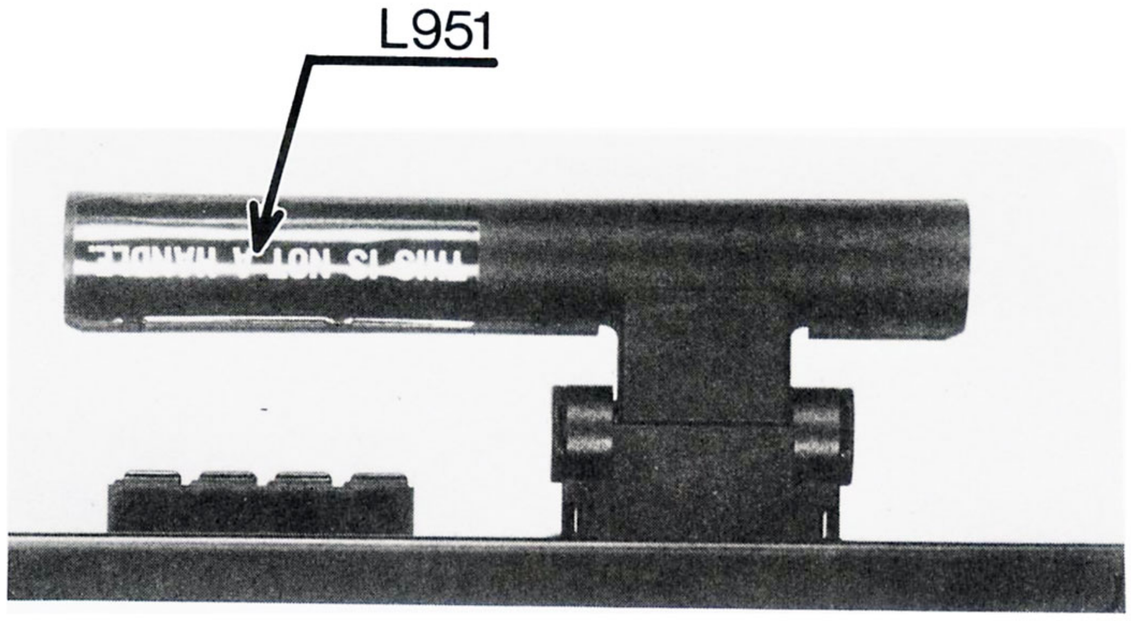
5 Tune station of moderate strength near 1400 kHz. Enter into preset 4. Adjust C 147 for maximum reading on meter.

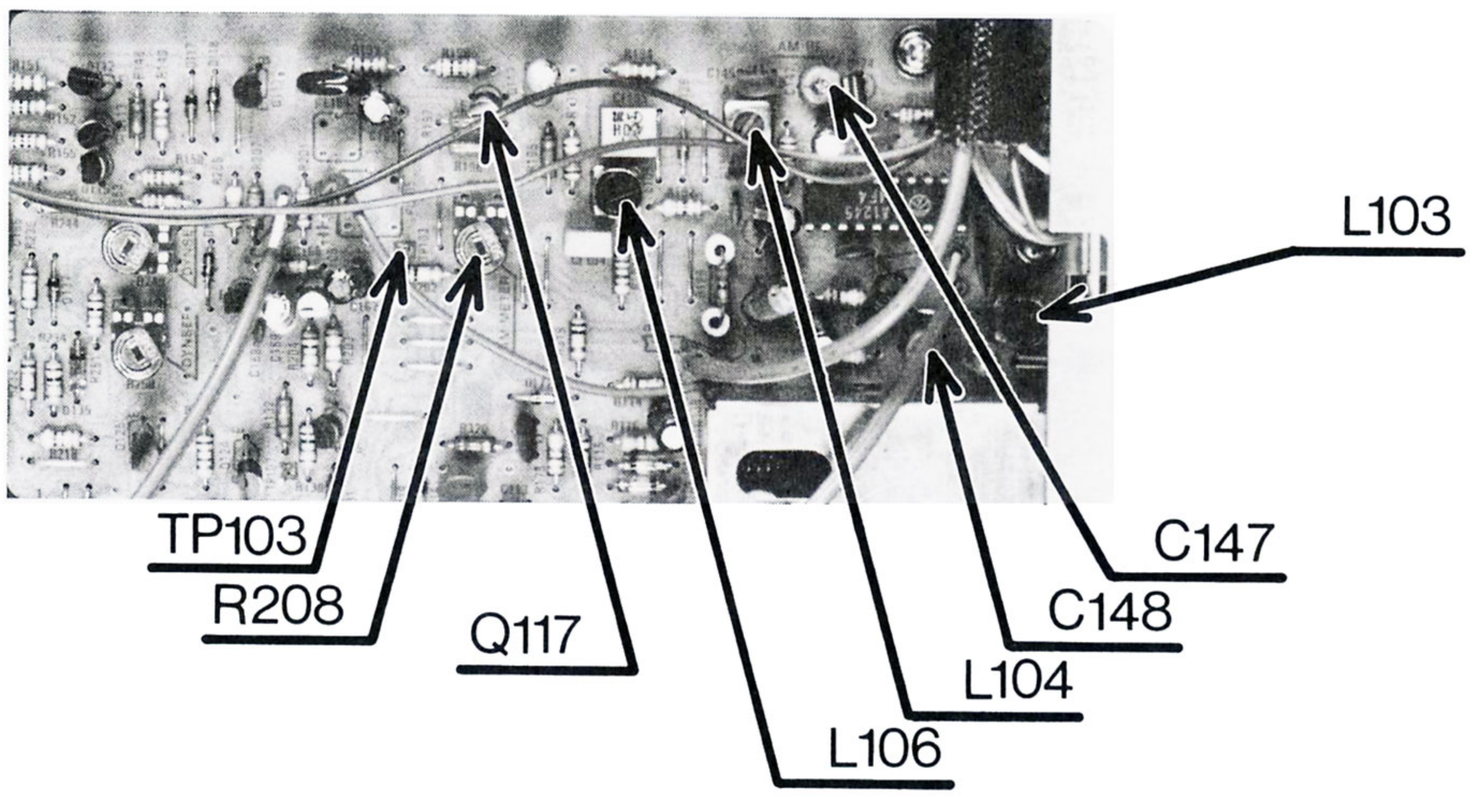
6 Repeat steps 3 and 5 until no further improvement is seen.

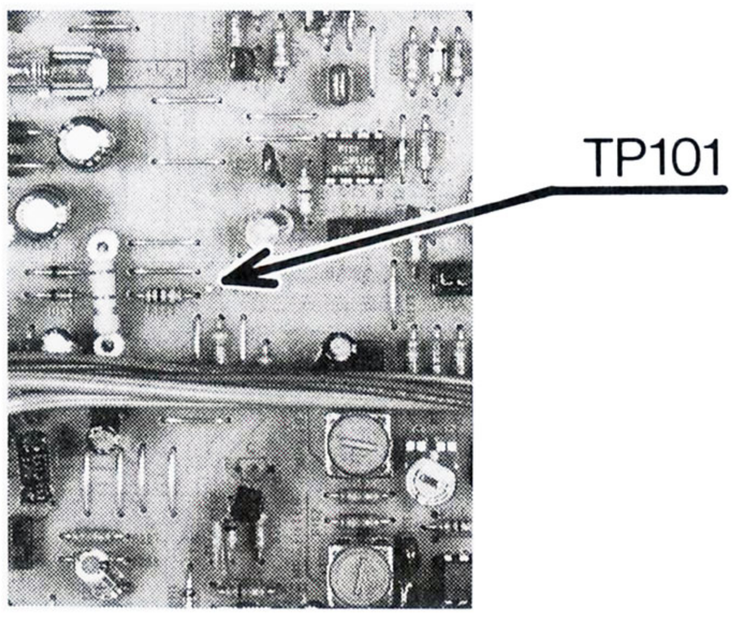
C SIGNAL METER, AUTO STOP

R 208 controls signal strength indication and auto stop level, adjust only if necessary, to correct for scan stopping on excessively weak signals, or failure to stop on moderately strong ones.

NOTE: When finished, lock antenna bar adjustment with laquer (nail polish), re-install label.







AMPLIFIER ALIGNMENTS

A IDLE (QUIESCENT) CURRENT

1 Connect mV meter (DVM) from TP601 to TP602, left chan. (from TP651 to TP652, right chan.)

2 Adjust R 624, left chan. (R 674, right chan.) so that meter reading is 20 - 25 mVDC.

NOTE: Reading may take a few minutes to stabilize; re-check after offset adjustment (next step.)

B OFFSET (CENTERING) VOLTAGE:

Adjust R 645. left (R 695, right) so that voltage at spkr. terminals is 0 ± 50 mVDC.

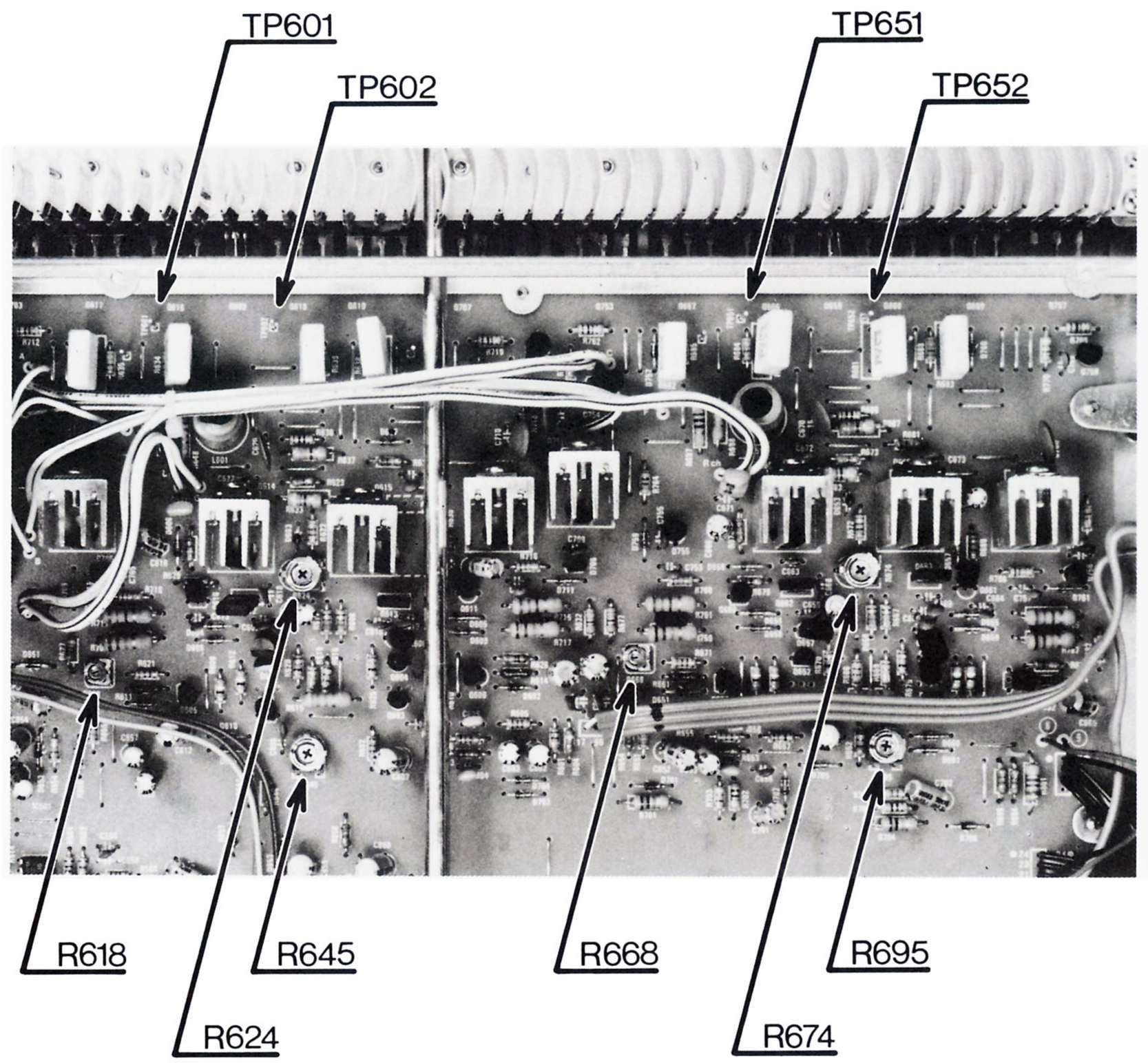
NOTE: Perform these adjustments with no load, volume minimum.

C MINIMUM DISTORTION

1 Connect distortion meter to the output terminal for speaker.

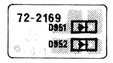
2 Feed 20 KHz from audio generator into "MAIN IN" and adjust its input level so that the output at the speaker terminal is 3 V (RMS) with no load.

3 Adjust R 618 (left channel) and R 668 (right channel) so that the distortion measured at the speaker output terminal will become minimum.



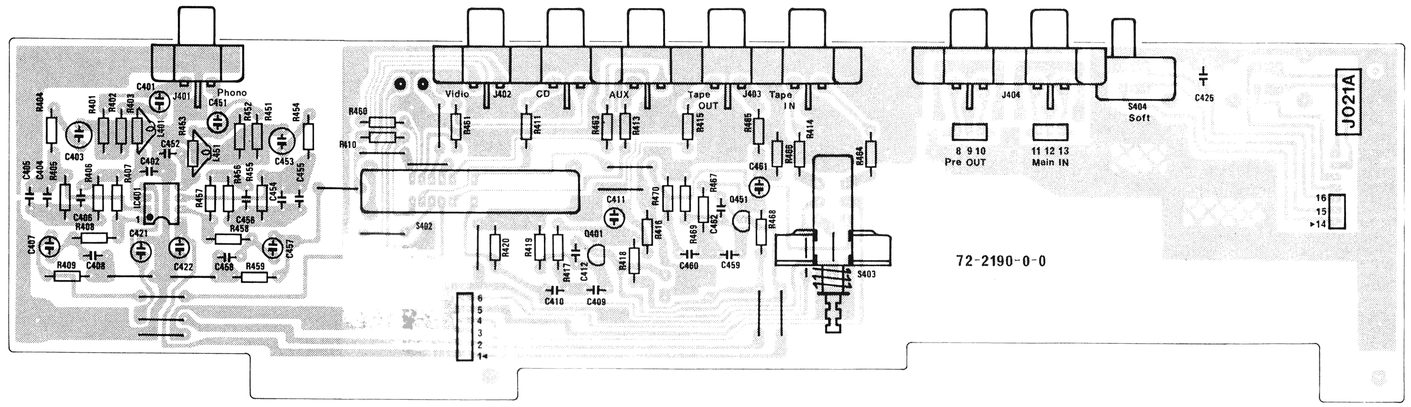
AMPLIFIER P.C.B. LAYOUT DIAGRAM

LED DISPLAY PCB

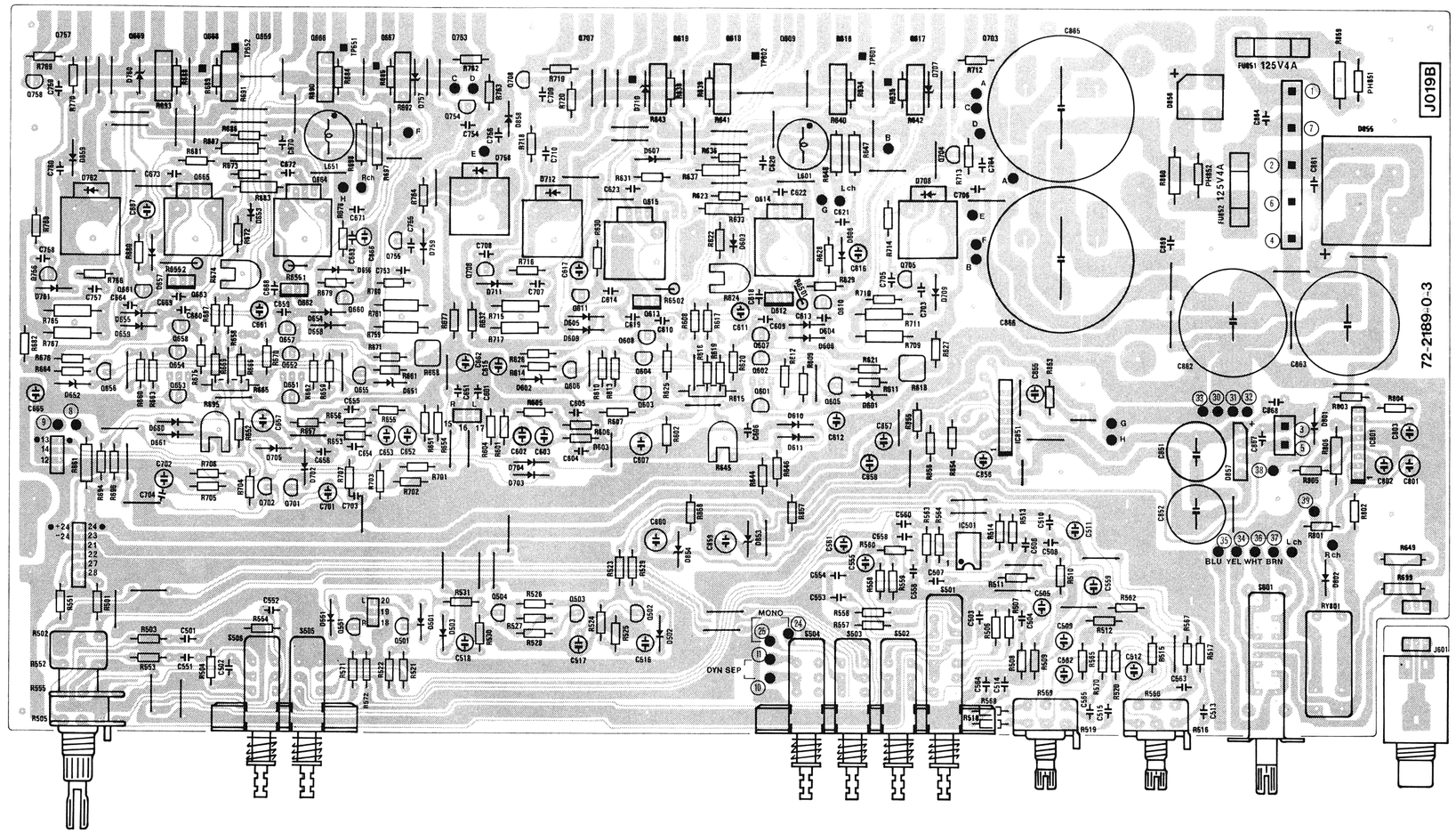


POWER SWITCH PCB

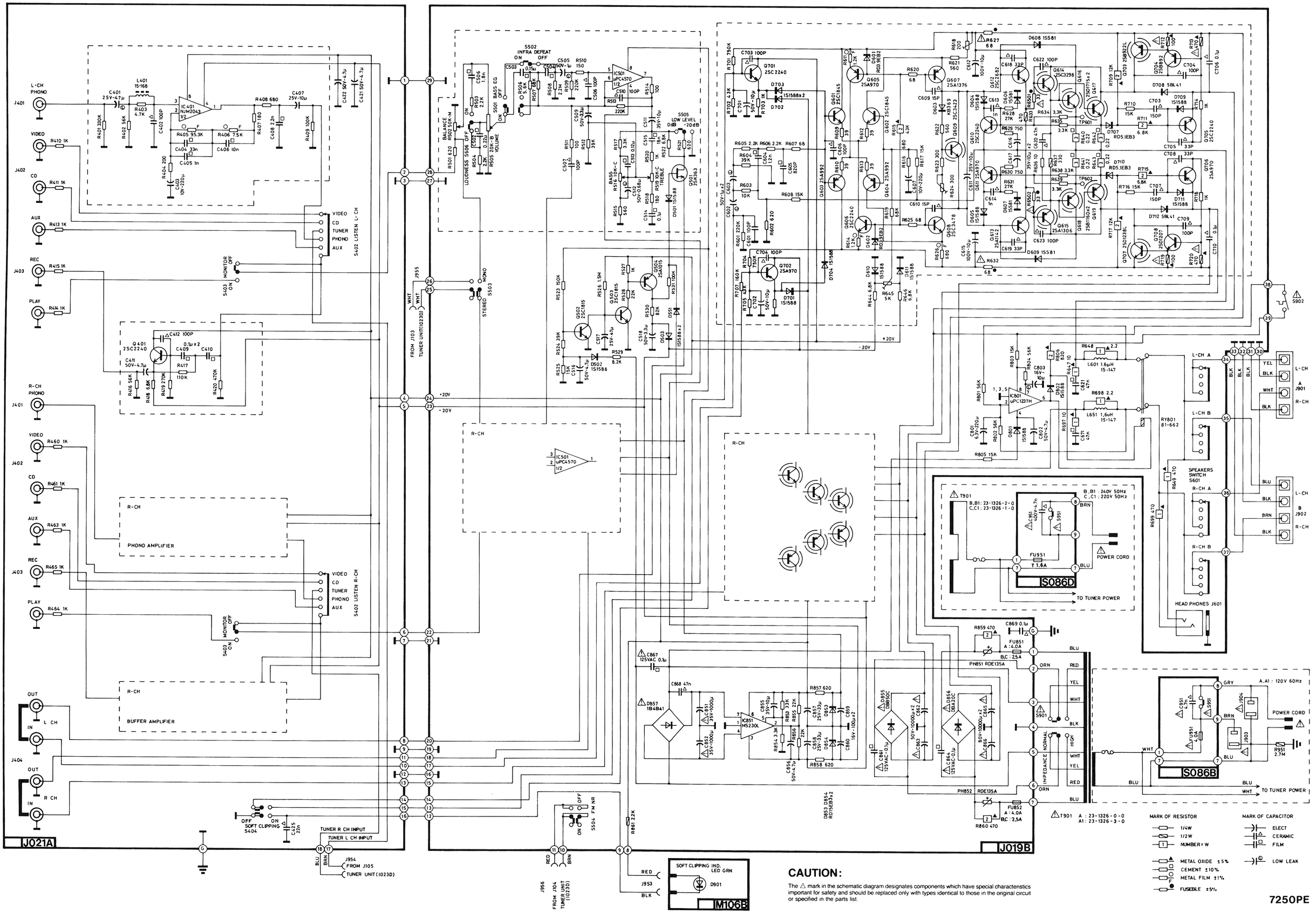
INPUT/OUTPUT PCB



MAIN/CONTROL AMP. & POWER SUPPLY PCB



SCHEMATIC DIAGRAM
NAD 7250PE AMPLIFIER SECTION



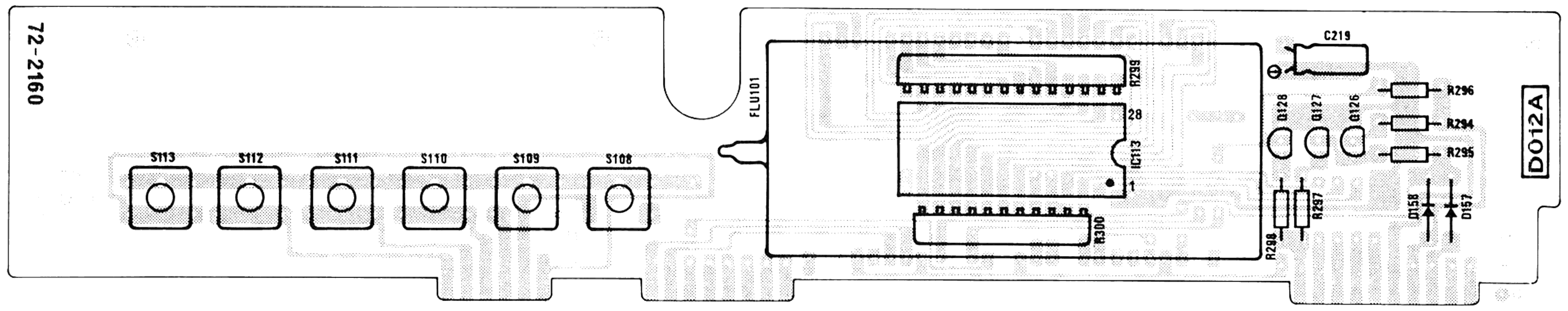
CAUTION:

The △ mark in the schematic diagram designates components which have special characteristics important for safety and should be replaced only with types identical to those in the original circuit or specified in the parts list.

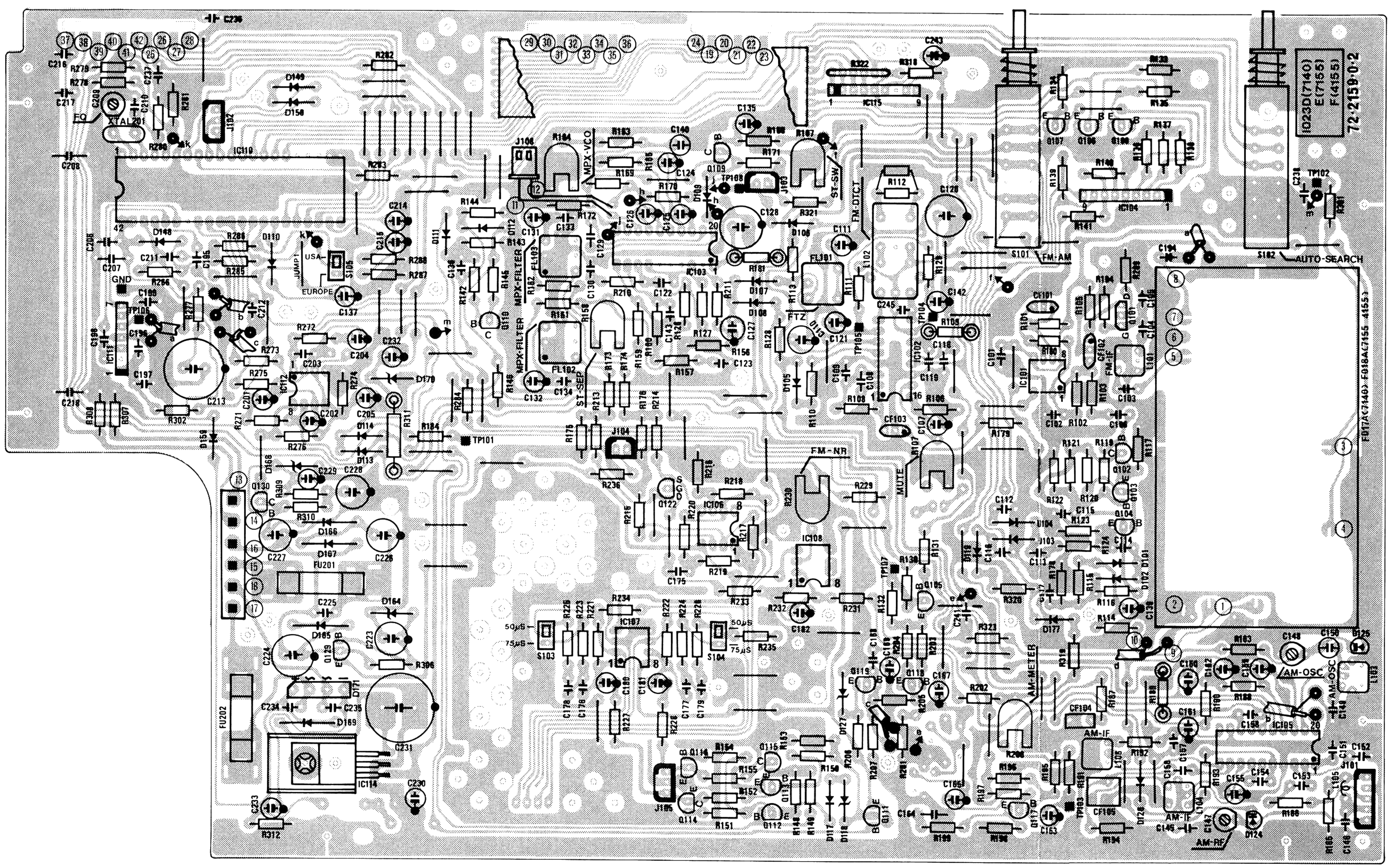
7250PE

TUNER P.C.B. LAYOUT DIAGRAM

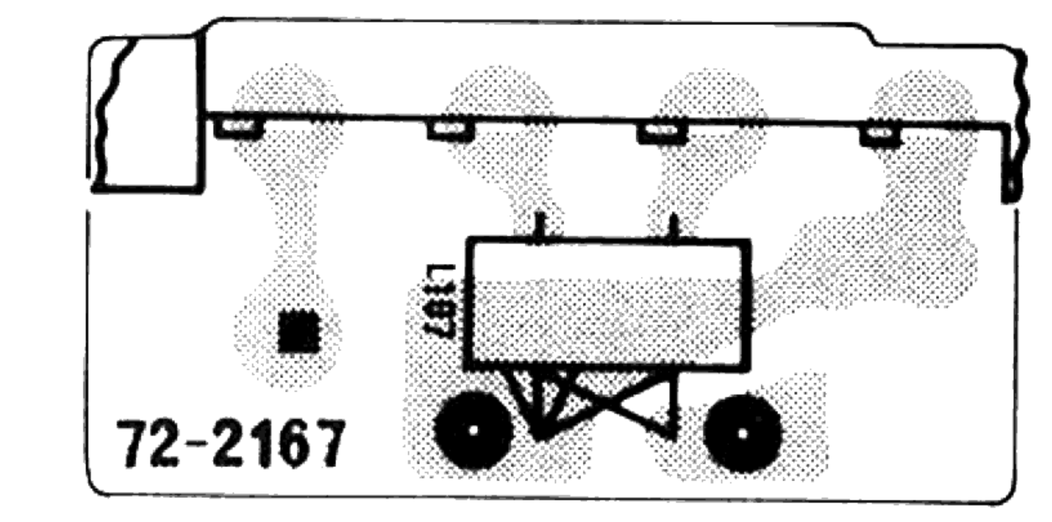
DISPLAY & PRESET SELECTOR PCB



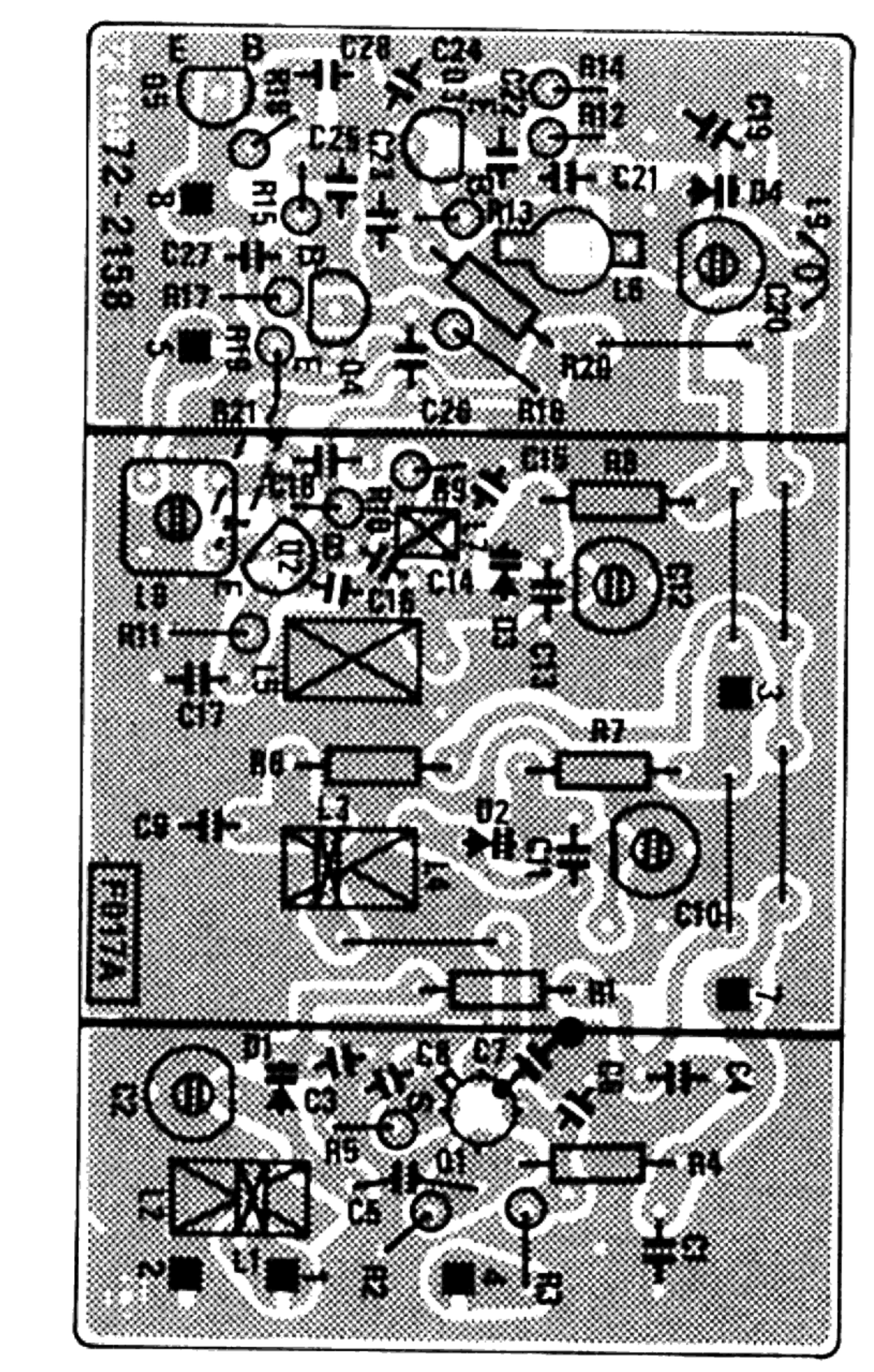
TUNER PCB



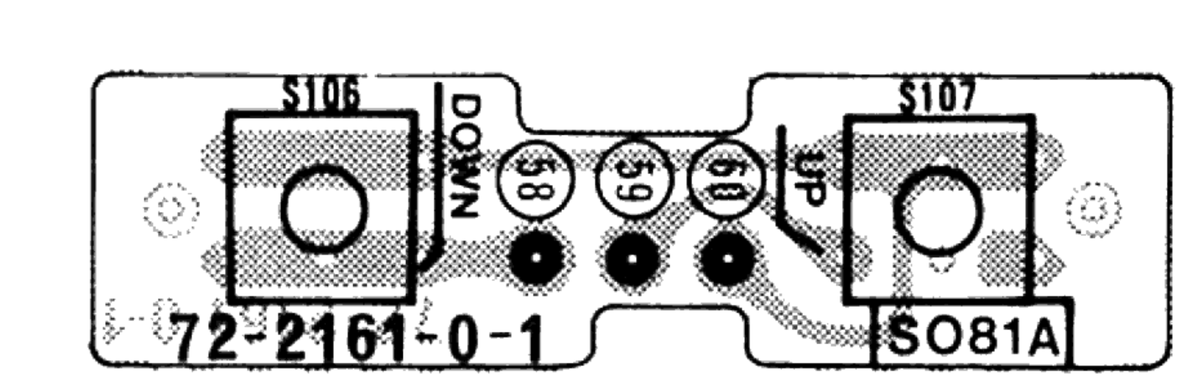
ANTENNA TERMINAL PCB



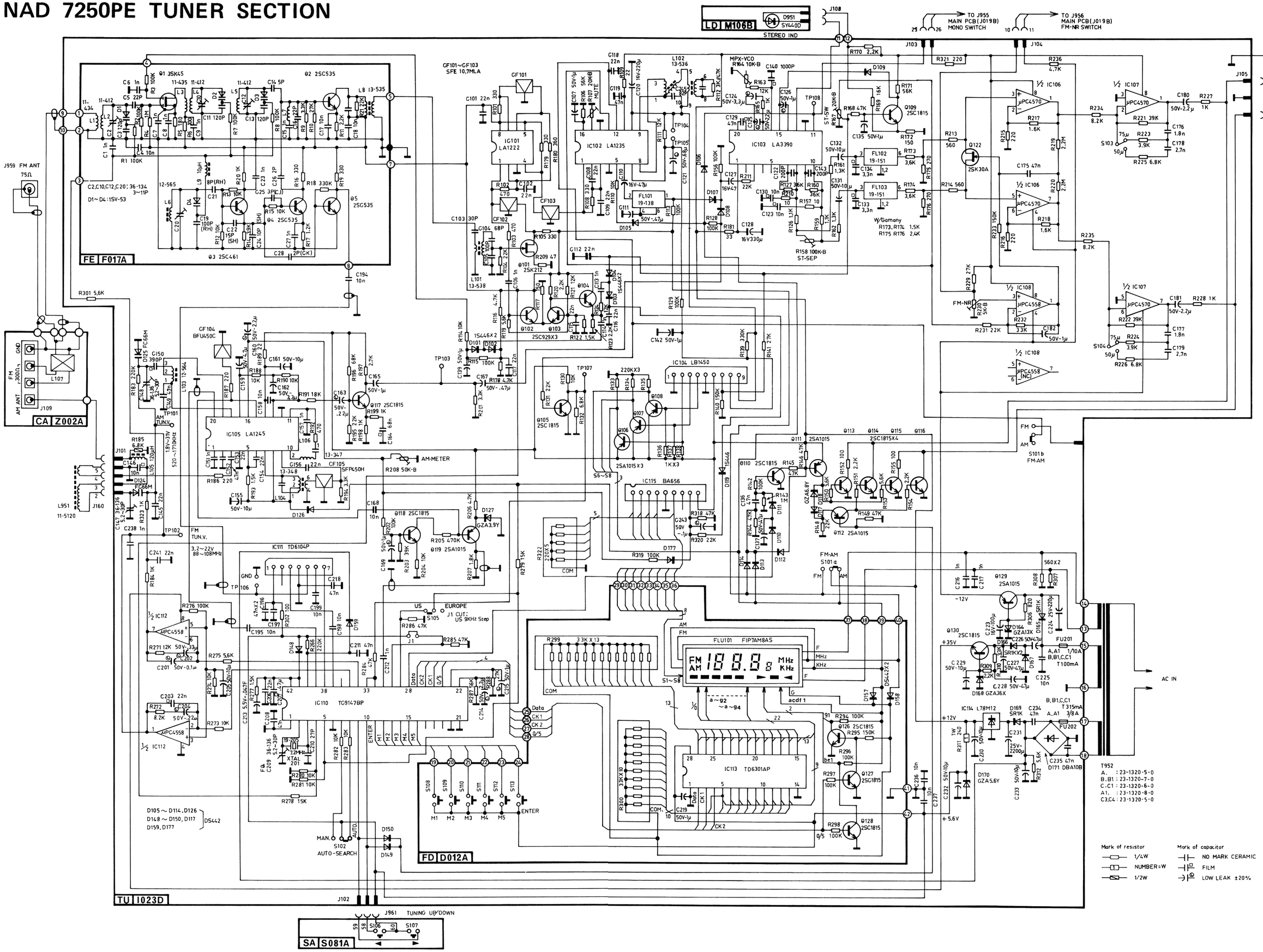
FRONTEND PCB



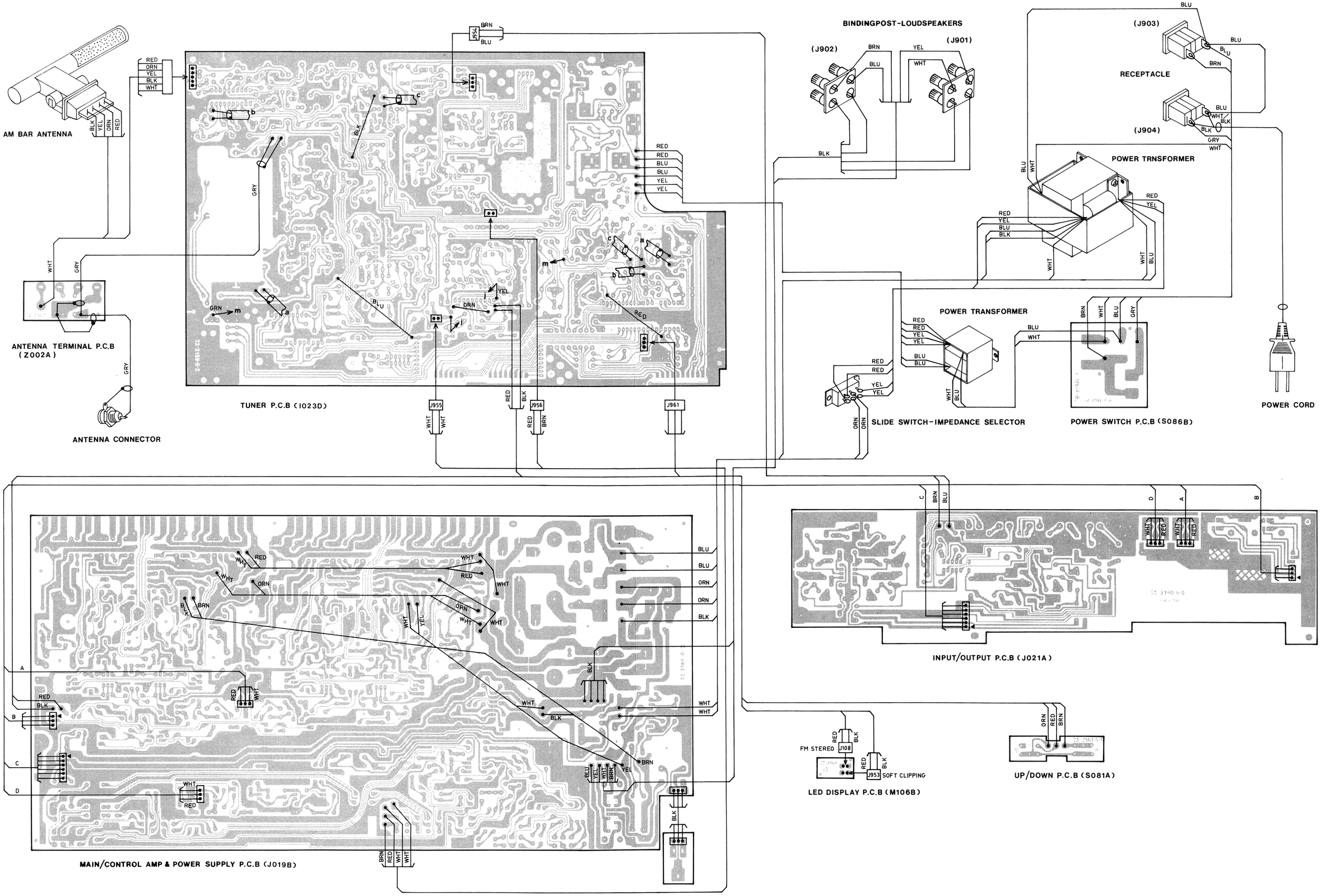
UP/DOWN PCB



SCHEMATIC DIAGRAM
NAD 7250PE TUNER SECTION



WIRING DIAGRAM



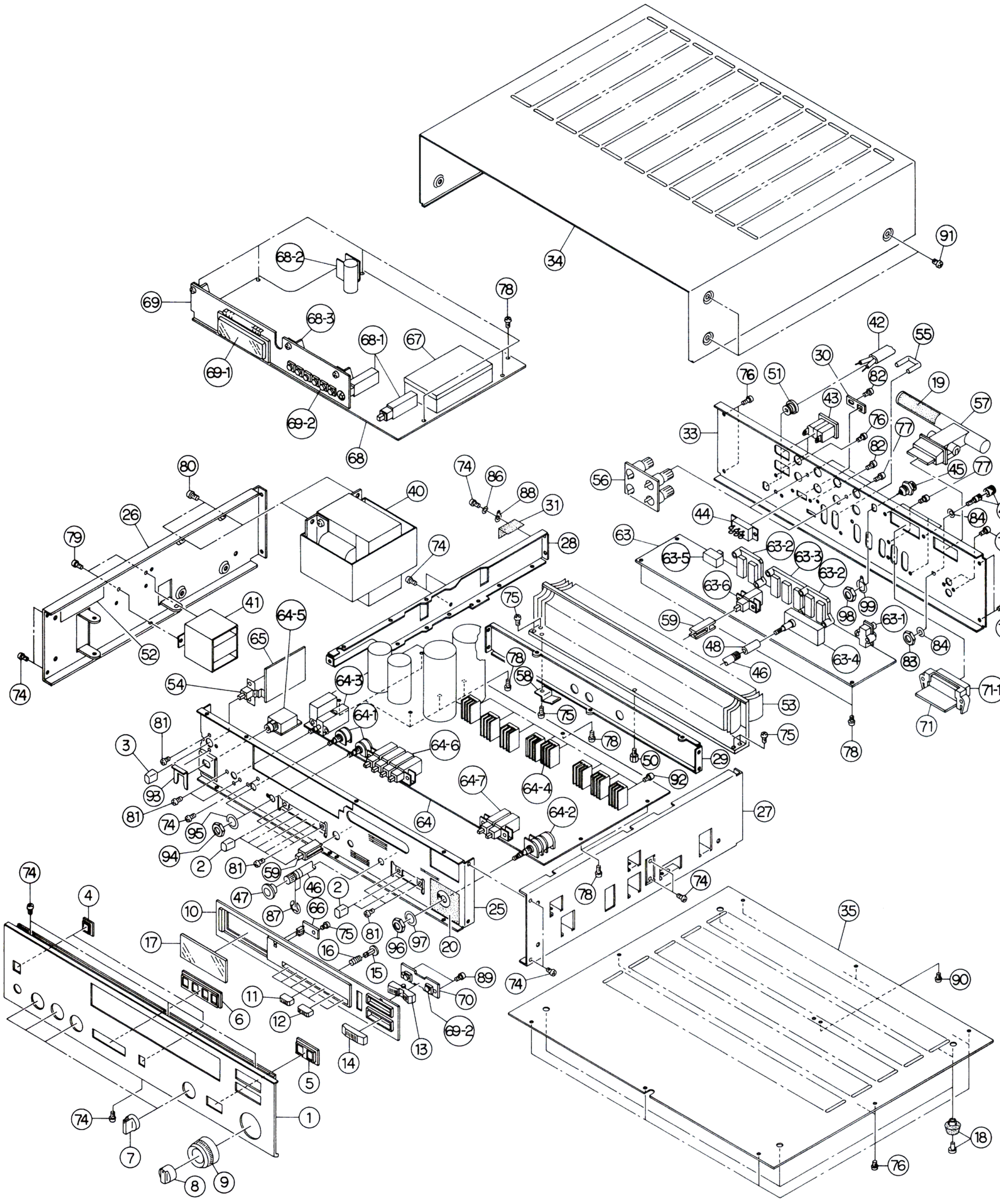
EXPLODED VIEW PARTS LIST

Ref. No.	Parts No.	Description
1	63-6273-1-0	FRONT PANEL
2	62-1105-0-0	PUSH BUTTON - SELECTORS
3	62-1105-1-0	PUSH BUTTON - ON/OFF
4	62-3465-0-0	PUSH BUTTON FRAME - SINGLE HOLE
5	62-3466-0-0	PUSH BUTTON FRAME - TWO HOLES
6	62-3468-0-0	PUSH BUTTON FRAME - FOUR HOLES
7	62-2317-0-0	ROTARY KNOB - TONE CONTROL/SELECTORS
8	62-2318-0-0	ROTARY KNOB - BALANCE
9	62-2319-0-0	ROTARY KNOB - VOLUME
10	62-3469-0-0	SUBPANEL
11	62-1106-0-0	PUSH BUTTON - BLACK
12	62-1106-1-0	PUSH BUTTON - LIGHT BROWN
13	62-1107-0-0	ROCKER BUTTON - UP/DOWN TUNE
14	62-1108-0-0	PUSH BUTTON - AUTO SEARCH
15	62-3471-0-0	PUSH BUTTON PLUNGER
16	88- 170-0-0	SPRING - PUSH BUTTON RETURN
17	63-5169-0-0	DISPLAY WINDOW
18	92-2103-0-0	FOOT - PLASTIC RIVET TYPE
19	63-1844-0-0	LABEL: THIS IS NOT A HANDLE
20	63-1845-0-0	PLATE (POLYESTER)
25	71-2584-0-1	FRONT SUBCHASSIS
26	71-2614-0-0	SIDE CHASSIS (L)
27	71-2587-0-0	SIDE CHASSIS (R)
28	71-2618-0-0	SUBCHASSIS (FRONT TO REAR SUPPORT)
29	71-2617-0-0	SUBCHASSIS (LEFT TO RIGHT SUPPORT)
30	92-1223-0-1	LOCKING PLATE - IMPEDANCE SWITCH
31	92-1225-0-0	INSULATOR (PVC) (A A1)
33	71-2626-0-1	REAR PANEL (A)
	71-2626-1-0	REAR PANEL (A1)
	71-2617-0-0	REAR PANEL (B B1 C C1)
34	71-3107-0-0	CABINET
35	71-3104-0-0	BOTTOM COVER
40	23-1326-0-0	POWER TRANSFORMER (A)
	23-1326-1-0	POWER TRANSFORMER (C C1)
	23-1326-2-0	POWER TRANSFORMER (B B1)
	23-1326-3-0	POWER TRANSFORMER (A1)
41	23-1320-5-0	TUNER POWER TRANSFORMER (A C3 C4)
	23-1320-6-0	TUNER POWER TRANSFORMER (C C1)
	23-1320-7-0	TUNER POWER TRANSFORMER (B B1)
	23-1320-8-0	TUNER POWER TRANSFORMER (A1)
42	85- 258-0-0	POWER CORD (A)
	85- 260-0-0	POWER CORD (A1)
	85- 240-0-0	POWER CORD (B)
	85- 259-0-0	POWER CORD (B1)
	85- 235-0-0	POWER CORD (C C1)
43	82-2178-0-0	RECEPTACLE (A A1)
44	81- 450-0-0	SLIDE SWITCH - IMPEDANCE SELECTOR (A B B1 C C1)
	81- 452-0-0	SLIDE SWITCH - IMPEDANCE SELECTOR (A1)
45	82-2162-0-0	F TYPE ANTENNA CONNECTOR (A A1)
	82- 293-0-0	DIN TYPE ANTENNA CONNECTOR (B B1 C C1)

Ref. No.	Parts No.	Description
46	65- 128-0-0	SHAFT - SELECTOR
47	62-3472-0-0	BUSHING FOR SHAFT SELECTOR
48	62-3474-0-0	JOINT FOR SHAFT SELECTOR
49	87-3242-0-0	GROUND TERMINAL
50	87-3246-0-0	STUD BOTTOM COVER SUPPORT
51	62-3332-0-0	BUSHING - AC POWER CORD
52	63-1843-0-0	LABEL (CAUTION FOR FUSE) (A A1)
53	74-3110-0-0	HEAT SINK
54	81-2333-0-0	PUSH SWITCH - ON/OFF
55	82- 118-0-0	JUMPER CONNECTOR
56	82-2164-0-0	BINDINGPOST - LOUDSPEAKERS
57	11-5120-0-0	AM BAR ANTENNA
58	RH-14	THERMAL SWITCH CLAMP
59	62-3473-0-0	EXTENSION SHAFT FOR TAPE MONITOR
63	J021A	INPUT/OUTPUT PCB
63-1	82-2130-0-0	RCA CONNECTOR - SINGLE
63-2	82-2157-0-0	RCA CONNECTOR - DOUBLE
63-3	82-2159-0-0	RCA CONNECTOR - TRIPLE
63-4	81- 184-0-0	ROTARY SWITCH - LISTEN SELECTOR
63-5	81- 447-0-0	SLIDE SWITCH - SOFT CLIPPING
63-6	81-2339-0-0	PUSH SWITCH - TAPE MONITOR
64	J1019B	MAIN/CONTROL AMP & POWER SUPPLY PCB
64-1	41- 685-0-0	ROTARY POTENTIOMETER - BASS & TREBLE
64-2	41- 688-0-0	ROTARY POTENTIOMETER - VOLUME
64-3	81- 188-0-0	ROTARY SWITCH -LOUDSPEAKER SELECTOR
64-4	74-3109-0-0	HEAT SINK
64-5	82-2169-0-0	HEADPHONE JACK
64-6	81-2337-0-0	FUNCTION SWITCH BANK (4 SWITCHES)
64-7	81-2338-0-0	FUNCTION SWITCH BANK (2 SWITCHES)
65	S086B	POWER SWITCH PCB
66	M106B	LED DISPLAY PCB
67	F017A	FM FRONT-END PCB
68	I023D	TUNER PCB
68-1	81-2325-0-0	FUNCTION SWITCH - AUTO SEARCH & AM/FM SELECTOR
68-2	74- 388-0-0	HEAT SINK
68-3	71-1889-0-0	PCB SUPPORT
69	D012A	DISPLAY & PRE-SET SELECTOR PCB
69-1	7AM8AS	FLUORESCENT INDICATOR TUBE
69-2	81-2326-0-0	MOMENTARY SWITCH - PRE-SET & UP/DOWN
70	S081A	UP/DOWN PCB
71	Z002A	ANTENNA TERMINAL PCB
71-1	82-2163-0-0	CONNECTOR - ANTENNA TERMINAL
74		TAPPING SCREW (PHILLIPS HEAD 3×6 Cr)
75		TAPPING SCREW (PHILLIPS HEAD 3×8 Cr)
76		TAPPING SCREW (PHILLIPS HEAD 3×6 BLK)
77		TAPPING SCREW (PHILLIPS HEAD 3×8 BLK)
78		TAPPING SCREW (WASHER HEAD 3×6 Cr)
79		MACHINE SCREW S (WASHER HEAD 3×6 Cr)
80		MACHINE SCREW S (PHILLIPS HEAD 4×6 Cr)
81		MACHINE SCREW (PAN 3×6 Cr)

Ref. No.	Parts No.	Description
82		MACHINE SCREW (PHILLIPS HEAD 3×8 BLK)
83		NUT (HEXAGON M4-7-3.2 Cr)
84		WASHER (PLAIN 4-10-0.8 Ni)
85		WASHER (TOOTHED LOCK B4 Ni)
86		WASHER (TOOTHED LOCK B3 Ni) (A A1)
87		RETAINING RING (E TYPE 5)
88		TERMAL LUG (3 Ni) (A A1)
89		TAPPING SCREW (PAN 2.6×6 Cr)
90		MACHINE SCREW (PHILLIPS HEAD 3×6 Cr)
91		CABINET SCREW WITH WASHER (4×6 BLK)
92		MACHINE SCREW (PHILLIPS HEAD 3×8 Cr)
93		LOCKING PLATE-HEAD PHONE JACK (HLJ0999-01-480)
94		TONE CONTROLS NUT (HEXAGON 7-11-2)
95		WASHER (PLAIN 7-12-0.5)
96		VOLUME CONTROL NUT (HEXAGON 9-11-2)
97		WASHER (PLAIN 9-14-0.5)
98		F-CONNECTOR NUT (HEXAGON UNF 3/8-11-2)
99		TERMINAL LUG (MET31-0107)

EXPLODED VIEW



ELECTRICAL PARTS LIST

NOTE: This is not a complete electrical parts list.

INPUT/OUTPUT P.C.B.: J021A (EXPLODED VIEW REF. NO. 63)

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
IC401	NJM2043DD	INTEGRATED CIRCUIT
Q401, Q402	2SC2240	TRANSISTOR
L401, L451	15-168	COIL 3.7mH
C401, C451	25V,4.7μF	ELECTROLYTIC CAPACITOR LOW LEAKAGE
R405, R455	95.3KΩ, 1/4W	METAL FILM RESISTOR
R406, R456	7.5KΩ, 1/4W	〃

MAIN/CONTROL AMP & POWER SUPPLY P.C.B.: J019B (EXPLODED VIEW REF. NO. 64)

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
IC501	μPC4570C	INTEGRATED CIRCUIT
IC801	μPC1237H	〃
IC851	M5230L	〃
Q501, Q551	2SK363	TRANSISTOR
Q502, Q503	2SC1815	〃
Q504	2SA1015	〃
Q601, Q602, Q651, Q652	2SC1845	〃
Q603, Q604, Q653, Q654	2SA992	〃
Q605, Q611, Q655, Q661 Q702, Q706, Q756	2SA970	〃
Q606, Q610, Q656, Q660 Q701, Q705, Q755	2SC2240	〃
Q607, Q657	2SA1376	〃
Q608, Q658	2SC3478	〃
Q609, Q659	2SC3423	〃
Q612, Q662	2SC2682	〃
Q613, Q663	2SA1142	〃
Q614, Q664	2SC3298	〃
Q615, Q665	2SA1306	〃
Q616, Q617, Q666, Q667	2SD1715	〃
Q618, Q619, Q668, Q669	2SB1160	〃
Q703, Q753	2SB922L	〃
Q704, Q754	2SB892	〃
Q707, Q757	2SD1238L	〃
Q708, Q758	2SD1207	〃
D501, D502, D503, D551 D604, D605, D610, D611 D654, D655, D660, D661 D702, D703, D704, D705 D709, D711, D759, D761 D801, D802	1S1588	DIODE

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
D601, D602, D651, D652	RD3.9EB2	DIODE
D603, D653	KB369	〃
D606, D607, D608, D609	1SS81	〃
D656, D657, D658, D659		
D707, D710, D757, D760	RD5.1EB3	〃
D708, D712, D758, D762	5BL41	〃
D853, D854	RD15EB3	〃
D855	DBB50CK15	〃
D856	DBA20CK15	〃
D857	1B4B41	〃
L601, L651	15-147	COIL 1.6μH
C505, C555, C602, C603 C652, C653	50V, 1μF	ELECTROLYTIC CAPACITOR LOW LEAKAGE
C512, C562	50V, 0.68μF	〃
C803	16V, 10μF	〃
C851, C852	35V, 1000μF	ELECTROLYTIC CAPACITOR
C862, C863	50V, 10000μF	〃
C865, C866	80V, 10000μF	〃
R611, R614, R661, R664	1.21KΩ, 1/4W	METAL FILM RESISTOR
R615, R665	43KΩ, 2W	OXIDE METAL RESISTOR
R618, R668	41-7106	VARIABLE RESISTOR, 200Ω
R624, R674	41-782	VARIABLE RESISTOR, 300Ω
R626, R676	680Ω, 1/4W	METAL FILM RESISTOR
R627, R632, R677, R682	68Ω, 1/4W	FUSIBLE RESISTOR
R640, R641, R642, R643 R690, R691, R692, R693	0.22Ω, 3W	CEMENTED WIREWOUND RESISTOR
R645, R695	41-787	VARIABLE RESISTOR 5KΩ
R647, R697	10Ω, 1W	OXIDE METAL RESISTOR
R648, R698	2.2Ω, 1W	〃
R649, R699	470Ω, 1W	〃
R709, R717, R759, R769	12KΩ, 2W	〃
R711, R715, R761, R765	6.8KΩ, 2W	〃
R712, R719, R762, R769	100Ω, 1/2W	〃
R713, R720, R763, R777	470Ω, 1/2W	〃
R806	820Ω, 2W	〃
R859, R860	470Ω, 2W	〃
R6501, R6502, R6551, R6552	33Ω, 1/4W	FUSIBLE RESISTOR
PH851, PH852	RDE135A	P.T.C.
RY801	81-622, MR72	RELAY
FU851, FU852	5TT4 5ST2.5	FUSE (A, A1) 125V, 4A FUSE (B, C) 250V, 2.5A
S902	81-7005	THERMOSTAT 110°C

POWER SWITCH P.C.B.: S086B (EXPLODED VIEW REF. NO. 65)

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
FU951	5TT4	FUSE (A, A1) 125V, 4A
	5ST1.6	FUSE (B, C) 250V, 1.6A

LED DISPLAY P.C.B.: M016B (EXPLODED VIEW REF. NO. 66)

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
D951	SY440D	LED, FM STEREO
D952	SG240D	LED, SOFT CLIPPING

FM FRONT-END P.C.B.: F017A (EXPLODED VIEW REF. NO. 67)

SYMBOL NO.	PARTS NO.	DESCRIPTIONS
Q1	3SK45	TRANSISTOR
Q2, Q4, Q5	2SC535B	〃
Q3	2SC461B	〃
D1 ~ D4	1SV55	DIODE, VARIABLE CAPACITANCE
L1	11-434	FM ANTENNA COIL
L2, L4, L5	11-412	FM RF COIL
L3,	11-435	〃
L6	12-565	OSC COIL
L7	15-152	CHOKE COIL
L8	13-533	IFT COIL
L9	15-166	CHOKE COIL
C2, C10, C12, C20	36-134	TRIMMER CAPACITOR, 3 ~ 11pF

TUNER P.C.B.: I023D (EXPLODED VIEW REF. NO. 68)

SYMBOL NO.	PARTS NO.	DESCRIPTION
IC101	LA1222	INTEGRATED CIRCUIT
IC102	LA1235	〃
IC103	LA3390	〃
IC104	LB1450	〃
IC105	LA1245	〃
IC106, IC107	uPC4570	〃
IC108, IC112	uPC4558	〃
IC110	TC9147BP	〃
IC111	TD6104P	〃
IC114	L78M12	〃
IC115	BA656	〃
Q101	2SK212	TRANSISTOR
Q102, Q103, Q104	2SC929	〃
Q105, Q109, Q110, Q113 Q114, Q115, Q116, Q117 Q118, Q130	2SC1815	〃
Q106, Q107, Q108, Q111 Q112, Q119, Q129	2SA1015	〃
Q122	2SK30A	〃

SYMBOL NO.	PARTS NO.	DESCRIPTION
D101, D102, D103, D104 D119	1S446	DIODE
D105 ~ D114, D117, D126 D148 ~ D150, D159, D177	DS442BT	〃
D118	GZA6.8Y	〃
D124, D125	FC66M	〃
D127	GZA3.9Y	〃
D164	GZA13X	〃
D165, D166, D167, D169	SR-1K	〃
D168	GZA36X	〃
D170	GZA5.6Y	〃
D171	DBA10B	〃
L101	13-538	IFT COIL
L102	13-536	FM DETECTOR COIL
L103	12-564	AM OSC COIL
L104	13-348	450KHz MATCHING COIL
L105	15-167	CHOKE COIL, 120μH
L106	13-347	IFT COIL
C147, C148, C209	36-136	TRIMMER CAPACITOR, 5.2~ 30pF
C121	50V, 0.68μF	ELECTROLYTIC CAPACITOR LOW LEAKAGE
C124	50V, 3.3μF	〃
C125, C160, C214	50V, 2.2μF	〃
C126, C169, C215	50V, 1μF	〃
C163, C204	50V, 0.22μF	〃
C201	50V, 0.33μF	〃
C202, C243	50V, 0.1μF	〃
C213	5.5V, 0.047μF	MEMORY BACKUP CAPACITOR
R107, R167	41-789	VARIABLE RESISTOR, 20KΩB
R158	41-792	〃 , 100KΩB
R164	41-788	〃 , 10KΩB
R208	41-791	〃 , 50KΩB
R230	41-787	〃 , 5KΩB
R322	200KΩ $\times$5	RESISTOR ARRAY
CF101, CF102, CF103	19-155	CERAMIC FILTER(C1)
〃	19-154	〃 (A,A1,B,C)
CF104	19-136	〃
CF105	19-140	〃
FL101	19-138	ANTIBIRDIE FILTER
FL102, FL103	19-151	LOW PASS FILTER
FL104	19-152	〃
FL105	19-153	〃
XTAL201	19-205	CRYSTAL, 7.2MHz
FU201	MDL1/10A	FUSE(A,A1),250V, 1/10A
〃	100mA	FUSE(B,C),250V, 100mA
FU202	MDL3/8A	FUSE(A,A1),250V, 3/8A
〃	315mA	FUSE(B,C),250V, 315mA

DISPLAY & PRE-SET SELECTOR P.C.B.: D012A (EXPOLODED VIEW REF. NO. 69)

SYMBOL NO.	PARTS NO.	DESCRIPTION
IC113	TD6301AP	INTEGRATED CIRCUIT
Q126, Q127, Q128	2SC1815	TRANSISTOR
D157, D158	DS442	DIODE
R299	33KΩ × 13	RESISTOR ARRAY
R300	33KΩ × 10	〃
FLU101	7AM8AS	FL INDICATOR

ANTENNA TERMINAL P.C.B.: Z002A (EXPLODED VIEW REF. NO. 71)

SYMBOL NO.	PARTS NO.	DESCRIPTION
L107	11-419	BALUN TRANSFORMER

SERVICE MANUAL

7250PE

AM/FM RECEIVER

NAD ELECTRONICS

BOSTON/LONDON